

A very precarious but highly interesting operation is that of assisting the development and propagation of wild creatures and wild plants in their natural homes. Some observations have been made on the subject now and again, and a few isolated experiments are on record, already suggestive of remarkable correlations between development and environment. The principles behind such correlations are wide reaching, and, as ecology has begun to show, of great practical importance. In due course, no doubt, the German scheme will include such experiments, care being taken to prevent that very easily obtained result, the absolute extinction of a species.

A. E. CRAWLEY.

THOMAS RUPERT JONES, F.R.S.

BORN in Wood Street, Cheapside, on October 1, 1819, Rupert Jones, after a long and eminently useful geological career, passed away in his quiet retreat at Chesham Bois on April 13, in his ninety-second year. His father, a silk merchant and throwster, had business premises in Taunton as well as in London, and Rupert Jones spent his early years in Somerset, receiving school education at Taunton and Ilminster. There the fossiliferous beds of the Lias attracted his attention, and the bent of his mind was directed towards science rather than commerce. In 1835 he was apprenticed to a surgeon at Taunton, and he completed his service at Newbury. Geology absorbed all his spare time, and many of his early observations in the neighbourhood of that Berkshire town were published in a pamphlet in 1854. After 1842 Rupert Jones was engaged for some years, chiefly in London, in medical practice. Familiar with the use of the microscope, he applied it with signal success to the study of fossil microzoa. His researches now brought him into contact with William Harris, of Charing, who had gathered a fine collection of Chalk fossils, including the minuter organisms. That geologist also possessed a daughter who became the first wife of Rupert Jones.

In 1849 his monograph of the Entomostraca of the Cretaceous formation of England, his earliest important work, was published by the Palæontographical Society. In the following year he was appointed assistant secretary to the Geological Society of London at Somerset House, where his ability and precision were shown in the editing of the society's quarterly journal. Ever busy, he edited during the years 1854-58 the last editions of Mantell's "Geological Excursions round the Isle of Wight," "Medals of Creation," and "Wonders of Geology." He likewise prepared for the Palæontographical Society further important monographs on the Tertiary Entomostraca (1856), and on Fossil Estheriæ (1862). In 1858 Rupert Jones was appointed lecturer on geology at the Royal Military College, Sandhurst, and four years later professor, when he resigned his post at the Geological Society, and removed to Farnborough, in Hampshire. In association with Dr. Henry Woodward he edited the first two volumes of *The Geological Magazine* in 1864-65, and among other works edited the "Reliquiæ Aquitanicæ" of E. Lartet and H. Christy (1875), and the second edition of "Dixon's Geology of Sussex" (1878).

His special studies were not neglected. He contributed to scientific societies and journals numerous original articles on recent and fossil Foraminifera, and Entomostraca (Ostracoda and Phyllopoda), subjects on which he came to be recognised as the leading authority in this country. Much work, moreover, was done in conjunction with his friends, W. K. Parker, H. B. and G. S. Brady, Henry Woodward,

J. W. Kirkby, and others. Thus he received aid in the preparation of the monographs on the Foraminifera of the Crag (1866-97), and on British Carboniferous Entomostraca (1874-84). In 1880 Prof. Jones retired to London as the special teaching of geology at Sandhurst was then abandoned by the military authorities.

His interests extended over a wide geological field, and he had a profound knowledge of the literature. South African geology especially attracted him. In later years he gave much attention to the antiquity of man, and wrote on the plateau implements in 1894. Of sturdy build, though below the average height, he was of a cheery disposition, prone to jocularity, but ever ready to give earnest help to others. Proof-correcting he regarded as one of his recreations. Prof. Jones was elected F.R.S. in 1872, and the Lyeu medal was awarded to him in 1890, by the council of the Geological Society. He was president of the Geologists' Association in 1879-81, and president of the Geological Section of the British Association at Cardiff in 1891.

H. B. W.

NOTES.

A MOST important discovery in regard to the existence of man in early Pleistocene or Pliocene strata has been made by the Marquis of Cerralbo in Spain. In the alluvial deposits of the River Jalon, which is an affluent of the Guadalquivir, he has discovered very abundant remains of undoubted *Elephas meridionalis* in contact with well-characterised implements of human workmanship of the proto-Chellean type. Photographs of the specimens and of the cuttings in which they occur have been received from the Marquis in Paris, and Prof. Marcelin Boule left Paris in Easter week in order to examine the site and the specimens. It is possible that *E. meridionalis* may have survived in the south of Europe from Pliocene into early Pleistocene times, but the association of implements of human workmanship with this early species of elephant is altogether new. This discovery tends to confirm the truth of Mr. Moir's contention that the admitted proto-Chellean flint implements discovered last year by him in Suffolk, and exhibited at the Geological Society in the autumn, are really anterior to the Red Crag deposit beneath which they occur. It is to be hoped that Mr. Moir will soon publish an illustrated account of his discovery.

A VERY interesting expedition is about to visit the neighbourhood of Astrakhan. It consists of a party of trained medical observers, provided with all appliances for research, organised in Paris, and under the personal direction of Prof. Elie Metchnikoff. The object of the expedition is two-fold. It will study the history of the endemic foci of plague in the neighbourhood of Astrakhan. The cause of the repeated outbreak of plague in this region, which although usually on a small scale is of almost regularly annual occurrence, will be investigated in the light of our present knowledge of the relation of rat-like animals and fleas to plague. A second object is to investigate the causes of the singular difference of susceptibility to phthisis presented by the Calmuck Tartars and the Russian town population. It appears that the Calmucks when living their usual nomadic life in tents are free from phthisis, yet when young Calmucks (semi-adult) are brought into the towns to be "educated," they invariably contract phthisis and die. What is the reason of the less susceptibility of the Russian town population? Is it due to immunity conferred by other microbes than that of tuberculosis which have escaped detection hitherto, and

are not present in the Calmuck communities, though regularly infecting and "immunising" the Russian town-dwellers in childhood?

THE death is announced of Dr. A. J. M. Bentley, distinguished by his knowledge of tropical diseases and as the author of "Berl Beri, its Etiology, Symptoms, Pathology, and Treatment."

THE death is announced, at sixty-six years of age, of Dr. B. S. Ringer, formerly medical officer to H.B.M. Consulate-General and the Chinese I.M. Customs, Canton, China, and the discoverer in Formosa of a parasitic worm known as *Distoma ringeri*.

THE Astronomical Society of France has just elected the following officers:—President, M. P. Puiseux, astronomer to the Paris Observatory; vice-president, Prince Roland Bonaparte; general secretary, M. Camille Flammarion; secretary, M. Jean Mascart; and treasurer, M. Maurice Ballot.

THE Christiania correspondent of *The Times* states that on April 20 a Bill was brought forward providing for the necessary grant for wireless telegraphy stations at Hammerfest and Spitsbergen. The Spitsbergen station will be kept open all the year round, and will be in charge of three or four men. The distance from the Hammerfest station is 750 miles.

A FUND has been opened for the purpose of presenting a testimonial to Mr. Henry Keeping, who has been for fifty years curator of the Geological Museum, Cambridge, and is now retiring from active work. There are probably many who will welcome this opportunity for expressing their appreciation of Mr. Keeping's long service in the cause of geology. Subscriptions should be sent to Mr. F. R. Cowper Reed, Sedgwick Museum, Cambridge.

A NEW system of wireless inductive telephony was inaugurated at Stratford-on-Avon on Thursday last, when Mr. H. von Kramer's "railophone" was tested on a train belonging to the Stratford-on-Avon and Midland Junction Railway. Two large frames—or coils—of wires are attached to the carriages, one being used for despatching messages and the other for receiving same. By means of induction between these coils and a wire running along by the side of the metals, but some distance away, and connected to instruments in the signal-cabins, messages can be received and despatched whilst the trains are in motion or standing. The test was successfully carried out, and a party of journalists and others were conveyed in the train for several miles, receiving or sending messages whilst *en route*. Eventually it is proposed to connect up the signal-cabins with the general telephone and telegraphic systems, thus making it possible to send and receive messages and telegrams to or from places far away from the railway whilst still in the train.

News of Captain Amundsen's Antarctic Expedition has been brought by Captain Nilsen, commanding the *Fram*, which arrived at Buenos Ayres a few days ago. It appears from a Reuter message that Captain Amundsen arrived in Antarctic regions on January 14, and the ship dropped anchor safely close to a comparatively elevated coast. Camp was established on a hill near where the *Fram* was moored, and preparations were begun for a journey to the Pole. The *Fram* sailed on February 14, before Captain Amundsen had started for the south. In a few weeks the vessel will leave Buenos Ayres for scientific work during a voyage between Africa and South America, and will then return to Buenos Ayres to renew her stores. Captain Nilsen expects to be able to leave

Buenos Ayres on October 1 in search of Captain Amundsen and his party.

THE death is announced of M. Edouard Dupont, director of the Royal Museum of Natural History in Brussels, and well known for his researches in many departments of geology. An appreciative notice by M. Cornet appears in *Le Mouvement Géographique* for April 9. M. Dupont was born at Dinant on January 31, 1841, and died at Cannes on March 31 of the present year at the age of seventy. His work in connection with the preparation of a geological map of Belgium is well known in the British Isles, and the complete skeletons of *Iguanodon*, discovered in the clays of Bernissart, were set up in the museum in Brussels under his care. While the palæontological collections were extended through his personal studies, he paid attention also to the stratigraphical conditions under which the rocks of Belgium were laid down. His researches were especially directed to the Carboniferous Limestone, in which he recognised a coral-reef type and also calcareous fragmental deposits of a pelagic character. In 1887 he made an expedition at his own expense to the Congo territory, the results being published in a book entitled "Lettres sur le Congo," in which geological, botanical, and anthropological observations were happily combined.

THE experiments of Mr. Glen Curtiss with his hydro-aéroplane have culminated in the production of a machine capable of running over land and travelling on the water with the same facility with which it rises from either of these elements into the air. His original model was fitted with two floats, a water-shield, and a large pontoon, but in his latest production only a single pontoon is used. This pontoon is rectangular in plan, 12 feet long, 2 feet wide, 1 foot deep, and 50lb. in weight. Its under surface curves up to meet the upper surface 3 feet from the front edge; similarly, its upper surface curves down to meet the under surface 3 feet from its rear edge. The aéroplane itself is of the usual type of Curtiss biplane, and carries under each extremity of the lower plane a skid, 4 feet long, to prevent the plane tips touching the water when turning upon it. Wheels are fitted in front and behind the pontoon. The aéroplane has made many successful flights at San Diego Bay (Cal.), rising easily into the air, and after flights gliding down to water, upon which it alighted without a splash. The diminution of speed caused by the head-resistance of the pontoon, which, as will be understood, does not possess the stream-line form, is said to be about five miles an hour.

DR. PETRIE'S discovery, which is reported in *The Times* of April 15, that the marmot is the host of fleas of very large size, may prove of considerable importance in connection with the study of the epidemiology of plague in Manchuria. Although it appears highly improbable that an epizootic has played any part in the outbreak in Manchuria proper, there is ample confirmation for the hypothesis that, in regions further west, the epidemic is derived from marmots. These animals, locally known as "tarbagans," are hunted for their skins. The occurrence of plague epizootics among them has been recognised for some years, but it is not known what form the disease takes, nor how it may be transmitted to the hunters. This demonstration of the existence of the marmot flea indicates a possible link in the chain of infection, and it is not improbable that future investigations will show that, in Manchuria, the marmot flea may to some extent play the same part as the rat flea in India. In the meantime, it cannot be said that this discovery brings us much nearer

to an explanation of the epidemic in Manchuria. No adequate reason has yet been found for the wide dissemination of the disease, at a season when few fleas of any kind are to be encountered. The appearance of the disease in a pneumonic form of exceptionally high virulence affords also a problem which still requires an answer. Although the Chinese epidemic has attracted so much attention, it becomes almost insignificant when compared with the ravages of the disease in India. Prof. Simpson, in a letter to *The Times* of April 17, directs attention to the enormous plague mortality in the United Provinces of Agra and Oudh, districts of which the joint population is little greater than that of the British Isles. Upwards of 72,000 persons died of plague in these provinces during March, and in the week ending March 25 the number of deaths reached the appalling figure of 22,000.

THE number of Easter vacation workers at the Port Erin Biological Station has this year, for the first time, exceeded fifty. The universities and university colleges of Birmingham, Cambridge, Cork, Liverpool, Manchester, and Reading are represented by members of their biological staff or by senior students; and the researchers include:—Prof. B. Moore and Mr. E. Whitley (bio-chemistry), Mr. Walter Tattersall, and Mr. E. W. Shann from Manchester, Prof. Cole from Reading, Mr. Douglas Laurie from Liverpool, a group of botanists—Prof. Harvey Gibson (Liverpool), Mr. J. C. Johnson (Cork), and Mr. R. H. Compton and Mr. S. Mangham (Cambridge)—working at algæ, a group of planktologists from Liverpool, including Mr. W. Riddell, Dr. W. J. Dakin, Prof. Herdman, and others. The new wing of the Biological Station, which was erected last winter, is now fully occupied by the researchers, and the larger laboratory is crowded with senior students. If numbers continue to increase, a further extension in the near future will certainly be required. The fish hatching is proceeding as usual. The first fertilised eggs of the plaice appeared in the spawning pond this year on February 13, but after that the cold, tempestuous weather seemed to delay the spawning, as the total numbers passed through the hatching-boxes up to date (April 20) are behind those of last year. The number of visitors to the aquarium of the institution is, however, considerably in advance of last year. Periodic observations on the plankton at sea are being taken from Prof. Herdman's yacht *Runa*, and the outstanding fact in this season's work, so far, is that the diatoms are unusually scarce and late. The vernal phytoplankton maximum has not yet arrived.

IN the Australian monthly, *The Lone Hand*, for February, Prof. J. Macmillan Brown discusses the question of the White Gods of Ancient America. He points to the singular fact that among the races of the Isthmus there is a large sprinkling of blonde-haired, blue-eyed, European-like men and women, whose origin is not to be explained by the theory of descent from the white emigrants of later historical times, this more recent European type being rapidly modified by environment and miscegenation, and quickly disappearing. He also refers to legends of the arrival in America of bearded white strangers, like Manco Capac. These stories, like the stone culture, are mainly confined to the Pacific littoral and the neighbouring mountain ranges. To explain these facts Prof. Brown postulates a Polynesian, that is to say, ultimately a Caucasian, immigration which passed northwards from Peru, from which direction he assumes that the culture represented by the Palenque ruins and that of the Aztecs had its origin. It can scarcely be said that the facts which

he has collected prove his theory; but the problems of the origin of Central American civilisation are so perplexing that this suggestion deserves consideration.

HITHERTO it has been generally believed that the paper read before the Society of Antiquaries in February, 1785, by W. Marsden, entitled "Observations on the Language of the People commonly called Gypsies," in which, from materials collected in 1783-4, he announced the similarity of Romani to some Indian dialects, was the first publication of the fact in this country, though it had been anticipated on the Continent by Rüdiger and Grillman. In *The Gypsy-Lore Journal* for January, Mr. J. Sampson advocates the prior claims to this discovery of Jacob Bryant, the author of that fantastic and now wholly useless treatise on mythology, "The New System, or an Analysis of Ancient Mythology." At the meeting of the Society of Antiquaries in the April following the receipt of Marsden's communication, that of Bryant, "Collections on the Zingara Gypsy Language," was read. The glossary of Bryant has now little value, and abounds in curious mistakes; but Mr. Sampson proves that the material was collected at least as early as 1776; and, if this be so, Bryant has the honour of having anticipated not only Marsden, but also the Continental philologists in this remarkable discovery.

IN the January number of *The Gypsy-Lore Journal*, Mr. D. F. de l'Hoste Ranking begins a useful analysis of the account of the beliefs and sociology of the Gypsies of Central Russia recently collected by Mr. V. N. Dobrovolski. This branch of the Gypsy race strongly insists on its Egyptian origin, and even assigns to Pharaoh the useful invention of the "jemmy," which enables them to tackle modern locks. They are on a much higher plane, as regards intelligence and culture, than the peasantry among whom they live. They possess, for instance, an elaborate system of defining time by the motions of the stars, a survival of their primitive nomadic life. Their most cherished possession is the whip, and the association of it with the marriage customs of the tribe, which Mr. Ranking suggests to be connected with marriage by capture, is more probably intended to expel the evil spirits which beset the bride and bridegroom at this crisis of their lives. The use of the doll in the betrothal rites seems to be based on a mimetic fertility charm. Their polytheism has now widely absorbed the national reverence for the ikons; and another form of magic includes the use by thieves of a candle made of a dead man's fat, the "Hand of Glory" of the "Ingoldsby Legends." Mr. Ranking suggests that the *provenance* of this last superstition may form an important link in the chain of evidence which may solve the problem of Gypsy origins, and he pleads for special inquiries regarding this belief.

MESSRS. E. LEITZ have issued a very useful pamphlet on the microscope and how to use it. The path of the rays, the meaning of aperture, resolving power, illumination, eye-pieces, and focussing are all briefly but fully explained, the text being illustrated with many excellent diagrams.

The Eugenics Review for April (iii., No. 1) contains an interesting and suggestive article, by J. H. Kohlbrugge (translated from the German by J. H. Koeppern), on the influence of a tropical climate on Europeans. It is pointed out that no white race has been able to survive in the tropics unless race-mixture has taken place, and as the white races cannot become really acclimatised, and as it is doubtful whether we can achieve satisfactory results by race blending, it is concluded that we can neither take the place of the native nor do without him.

Miss Chick and Dr. Martin give an interesting summary, with new experiments, on the readiness with which various rat fleas bite man (*Journ. of Hygiene*, xi., 1911, No. 1). The matter is of importance with reference to the spread of plague. They find that the common rat flea of temperate regions (*Ceratophyllus fasciatus*) readily bites man. Two more specimens of *Xenopsylla cheopis*, the common rat flea of India and other parts of the tropics, have been captured by Dr. Boycott at Guy's Hospital. Only one specimen of this flea has hitherto been recorded in England. The destruction of fleas by exposure to the sun is dealt with by Captain Cunningham, I.M.S., in No. 40 of the Scientific Memoirs of the Government of India. It is found that in the hot sun of India fleas die in about forty-five minutes, the result being chiefly due to the heat rays.

To Mr. F. L. Dames, of Berlin, we are indebted for a copy of "Bibliotheca Entomologica," a classified catalogue of entomological works and papers for sale at his establishment, containing, in this instance, 7633 items.

We have to acknowledge the receipt of a copy of the second number of *The Nature Photographer*, the official organ of the Nature Photographic Society. The feature of this issue is a portrait of a grey wagtail, which is a superb example of live-bird photography.

In our last week's number reference was made to a notice in the *Aarsberetning* of the Bergen Museum, of the recent scientific cruise of the *Michael Sars* in the Atlantic. A fuller and well-illustrated article on the same subject, by Dr. Johan Hjort, appears in *Naturen* for March and April. After an introductory notice of the object and extent of the cruise, attention is directed to the hydrographical results, which include observations on temperature and salinity taken at 110 stations, these being illustrated by maps and diagrams. After a short notice of the plankton, and another of pelagic animals, the deep-sea fishes taken during the cruise receive fuller attention, special interest attaching to the maps illustrating the localities where specimens of *Cyclothone*, *Gonostoma*, and *Chauliodus* were respectively taken.

Writing in his usual picturesque and attractive style, Sir Harry Johnston, in the April number of *The Quarterly Review*, pleads for the preservation of the fauna and flora, not only of the British Empire, but of the world at large. For he recognises that if effective measures are to be taken with this end in view, they ought to be taken without delay, "lest, before we can put in force regulations to save from destruction the rarer and more wonderful and beautiful of living forms on the earth's surface, they may be swept away for ever to gratify the whim or the taste of the uneducated many." Sir Harry puts the case in a very temperate manner, freely admitting that in many districts, East Africa for example, the claims of agriculture must be paramount, and that the wild fauna should be mainly restricted to reserves. In urging that such reserves should not be opened even to personages of the most exalted rank, the author has our full sympathy. Whether he is justified in his belief that the Lado white rhinoceros is even now in peril of extinction, may perhaps be doubtful; but we are in full accord with him in regarding a recent much-advertised slaughter of the species as altogether unjustifiable. That we ourselves are by no means blameless in such matters, is, however, proved by the evidence quoted as to the recent enormous destruction of sea-elephants in South Georgia.

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In the February number of *The Cairo Scientific Journal*, Mr. F. Hughes discusses the amount of silt carried by the Nile during the floods of 1908 and 1910. Observations were made near Cairo and at points on the Rosetta branch of the river, and results in parts per million of from 1200 to 2000 were obtained. Some examples were collected from canals of various dimensions, and the reduction of coarser suspended matter in some cases in subsidiary canals was very marked after a short distance.

The Dutch Meteorological Institute publishes a series of observations obtained by means of kites on board ship in tropical latitudes. Forty-one ascents are given, 2360 metres being reached in one case. Naturally the sets of observations at any one place are few, but the material will be of value in connection with such other information as accumulates in these little investigated regions. Pressure, temperature, humidity, and wind force and direction are given.

In the April number of *The Geographical Journal* the positions of nineteen geodetic positions of stations of the Uganda are given. The War Office intend to publish a full account of the operations and calculations connected with this work, and in a second part to discuss the local attraction, based on a comparison between the above positions, and the astronomical latitudes now being computed by the Belgian astronomer, M. Dehalu. The same number contains a reference to Dr. K. Peucker's proposals for the colouring of relief maps, for which aerial locomotion has produced demand. His method is based on the teachings of physiological optics, and there is certainly room for a more scientific and less empirical study of cartography in this country than has hitherto obtained.

A GEOGRAPHICAL report on the Franz Josef Glacier has been published by the New Zealand Department of Mines. Mr. J. M. Bell, the director, examined the area in 1908 and 1909, a topographical survey of the glacier and its tributaries being made with the theodolite and phototherodolite. A number of points were fixed and marked for future reference, for the frontal face of the main glacier is ever changing and it is difficult to determine its general direction of movement; on the whole, it seems to have retreated in recent times, and now stands at a point 692 feet above sea-level. Measurements of a series of points on the glacier surface gave rates of movement of from a foot a day near the side to about double this amount near the centre.

In "Extracts from Narrative Reports, 1907-8," of the Survey of India, are given more detailed results than can be included in the annual report. The diurnal variation of horizontal magnetic force was determined at Trichinopoly, in southern India; and a comparison of the magnetic instruments at Dehra Dun with those which Mr. D. C. Sowers, of the Carnegie Institute, had used while travelling overland from Pekin to Srinagar, was made. Full details of the secular change values for each month are given at each of the four magnetic observatories of Dehra Dun, Barrackpore, Toungoo, and Kodiakánal, as well as hourly means of declination and horizontal force. The section dealing with tidal and levelling operations gives the values of the tidal constants for the eight stations in operation. Binocular American precise levels were used by one party, and were to be used by all parties in the following season, by which change an appreciable increase in the rate of work was attained. In the work of the pendulum party the changes in the times of vibration of each of the four pendulums from 1904 to 1909 are given and discussed.

THE Seismological Society of America, which owes its foundation to the interest aroused by the Californian earthquake of 1906, has recently issued the first number of its quarterly Bulletin. Most of the short papers which it contains are devoted to the study of seismology in the United States, to the difficulties under which its prosecution labours, and to suggestions for organised work in the future. Among the papers of permanent interest may be mentioned Mr. H. F. Reid's account of the earthquakes felt in Central New Mexico in 1906 and 1907, and the list of seismographs known to be at work on the American continent, a list which includes no fewer than thirty-five Wiechert pendulums, twenty-nine Bosch-Omori pendulums, and nine Milne seismographs. Prof. Branner, in discussing the relations between earthquakes and the growth of faults, suggests the need for distinguishing between faults which are now active and others which have apparently reached a condition of stability, and he points out the useful work which might be carried out in this direction by the organised study of Californian earthquakes.

THE daily and yearly period of rainfall at Trieste is discussed by Dr. E. A. Kielhauser in an interesting paper laid before the Vienna Academy of Sciences in November last, based on eleven years' readings of the self-recording rain-gauge at the observatory (1896-1906). Among the many points referred to we may mention that the rain-curve of the amounts for separate hours shows that it is made up of a large number of waves of short periods. In addition to the most prominent extremes of the absolute maximum (11h.-12h. p.m.) and the absolute minimum (11h.-12h. a.m.), fifteen relative maxima and minima are exhibited. In spring and winter, the hours of 5 a.m. to 1 p.m. are relatively dry, while in summer and autumn they are relatively wet; for the other hours the reverse naturally obtains. At all seasons of the year the duration of rainfall is greatest at night-time. The annual rainfall is 39.7 inches (mean of sixty years, 42.8 inches). The driest months are February, April, December, and especially January; the wettest months are May, June, November, and especially September and October. The driest month of the eleven-year period was February, 1896 (0.07 inch), the wettest, October of the same year (10.7 inches).

THE April number of the Journal of the Röntgen Society contains a paper by Dr. W. Salomonson, of Amsterdam, on the induction coil, considered mainly from the point of view of the Röntgen-ray photographer. It is well illustrated by reproductions of photographs of the spark and of the primary current taken with a string galvanometer or an oscillograph. These show clearly that, as the capacity of the condenser in the primary is increased from a very small value, the time taken for the primary current to fall to zero at first decreases, then increases, in agreement with the theory of Mizuno. With an interrupter working in hydrogen or coal gas, the time of fall of the primary current may be reduced to 0.0002 second. Experiments with a new coil, by means of which photographs of the heart and lungs can be taken in 0.01 second, show that the spark is shaped like a corkscrew, and that it passes before the magnetic field due to the current in the primary has disappeared.

To those who are so unfortunate as to have to deal with electrical apparatus which has been flooded, the account of the steps taken by the railway and other companies to clean and dry the apparatus submerged during the Paris floods of 1910, published in *The Electrical Review* for April 14, will prove useful. It is compiled from the report of the Société des Electriciens, which relates to more

than a thousand pieces of apparatus which were dried satisfactorily. The apparatus was first washed either with water, or, if battery acid had attacked it, with dilute acid, then water, then weak alkali, then water. If oil had got into the apparatus it was first washed with benzoline. Any method of drying, if properly applied, was found effective. Fixed machinery was dried either by an air blast or by fires underneath, in the first instance, and the process completed electrically. Portable machinery was treated in ovens gas or steam-heated to 120° C. at atmospheric, or to 70° C. at reduced pressure. A 60-kilowatt direct-current generator gave up two gallons of water in the drying process. Storage cells appear to have come through the floods with very little deterioration.

MESSRS. CARL ZEISS (LONDON), LTD., have recently introduced the following novelties in optical instruments:—Mayer's new dissecting microscope has a characteristic form of exceptionally large stage, and can be fitted with either monocular or binocular observing systems. It can also take a stereocamera and drawing apparatus. Zeiss's field-glasses are made in a new form, possessing increased light-transmitting power combined with exceptionally large field. Strict alignment of the lenses is secured by casting the hinges and body in one piece. Telescope spectacles are for extreme myopia (10-20 dioptries), and give a field of more than 40°. For astigmatism a special form is provided. A new level is of small dimensions but of extreme sensitiveness. The bubble is observed by a reflecting prism, which shows images of the semicircular ends of the bubble. In adjusting the instrument, these semicircles are brought into contact along their diameters. All axes are truly cylindrical. The telescope is hermetically sealed up, and by means of a transferable eye-piece can be read from either end. The instrument is packed in a case about 8 inches by 5 inches by 2½ inches, and the accuracy equals that of a 12-inch or 14-inch level of ordinary type. The Cardioid condenser is for dark-ground microscopical illumination, and is chiefly for studying colloidal matters. It gives a narrow extreme annular illumination the rays of which reunite in the plane of the object. Colloidal gold particles of less than 10 μ can be seen moving rapidly in a field illuminated with this device. The oral illuminator contains a special arc lamp of 5 amperes fitted with a condensing arrangement for dental and mouth illumination. It is also fitted with a special tinted glass for bleaching the teeth. A new illuminating device for operating theatres consists of a powerful automatic-feeding arc lamp of 30 amperes, throwing a strong beam of light upon a large collecting lens. A system of mirrors breaks up and recollects the light so as to concentrate it free from shadows upon the operating table. The arrangement is, naturally, chiefly useful when surgical operations are performed at night.

IN an article on the central buffer-coupling appearing in *Engineering* for April 21, it is stated that there is a distinct tendency towards its adoption in countries where the 5-foot 6-inch gauge is the standard. In India, where there are some 16,300 miles of 5-foot 6-inch gauge line, the standard coupling is causing ever-increasing trouble. On one line, the renewals necessary to replace one year's breakages necessitated the placing of orders recently for 10,000 screw-couplings. As the present standards give a coupling of about the maximum weight which can be handled conveniently by the native staff, it is apparent that relief must be sought either by making use of much more costly material or in making a change in the type of draw-gear. The present trouble arises from the greater hauling capacity of modern locomotives, the extending use of high-

capacity wagons, and the more general application of automatic brakes. It is of interest to note that the central-buffer coupling produces less waste of energy in trains travelling on a curve. Tests carried out in India on a 5-foot 6-inch line showed that the side-buffered stock required an increase of power of 5.82 per cent. on a 40-chain curve as compared with similar stock, but fitted with central-buffer couplings.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES FOR MAY:—

- May 1. 11m. Venus in conjunction with the Moon (Venus $1^{\circ} 29' S.$).
 4. 11h. Uranus stationary.
 5. 6h. Mercury in inferior conjunction with the Sun.
 11. 16h. 53m. Jupiter in conjunction with the Moon (Jupiter $1^{\circ} 19' N.$).
 12. 17h. 57m. Moon eclipsed, partly visible at Greenwich.
 18. 9h. 16m. Uranus in conjunction with the Moon (Uranus $4^{\circ} 43' N.$).
 22. 13h. 54m. Mars in conjunction with the Moon (Mars $2^{\circ} 19' N.$).
 26. 7h. 15m. Saturn in conjunction with the Moon (Saturn $2^{\circ} 38' S.$).
 28. 14h. 28m. Mercury in conjunction with Saturn (Mercury $1^{\circ} 35' S.$).
 29. 14h. 51m. Venus in conjunction with Neptune (Venus $2^{\circ} 59' N.$).
 30. 14h. 57m. Neptune in conjunction with the Moon (Neptune $5^{\circ} 32' S.$).
 30. 16h. 50m. Venus in conjunction with the Moon (Venus $2^{\circ} 35' S.$).

COMETS AS MERELY OPTICAL PHENOMENA.—On a plate accompanying No. 4492 of the *Astronomische Nachrichten* there appear reproductions of fifteen photographs, each of which bears a striking resemblance to one or other of the various cometary forms made familiar to us by photographs of comets. But each of these images was produced by passing luminous rays through various lenses in abnormal positions, and the author, Signor Luigi Armellini, of Tarcento, throws out the suggestion that comets may only be optical phenomena produced by the distortion of solar rays passing through lenticular cosmical masses of meteorites. The author does not discuss the spectroscopic side of the question, and the idea is not novel, but the photographs reproduced are so realistic as to make the note of interest.

THE "ASTRONOMISCHEN JAHRESBERICHTS."—Owing to ill-health, Prof. Berberich has been forced to hand over the editorship of the extremely useful *Astronomischen Jahresberichts*, founded by the late Dr. Wislicenus in 1900, to the *Astronomische Rechen-Institut* of Berlin. In order that the year-book may not suffer by the change, Dr. Fritz Cohn, director of the *Rechen-Institut*, asks for the cooperation of astronomers who publish any papers during the year. The section on variable and new stars has been undertaken by Dr. Pračka, *Observatorium Nižbo* Bohemia, to whom extracts coming under that heading should be sent.

THE INTRINSIC LIGHT AND EFFECTIVE TEMPERATURES OF ALGOL AND ITS SATELLITE.—In a paper recently published in the *Bulletin Astronomique*, Dr. Nordmann discusses the intrinsic brightness and temperatures of Algol and its satellite by a method depending upon a knowledge of these quantities for the sun, and quite independent of his heterochrome photometer method. In the result, he finds that the surface brightness of Algol is about twenty-six times that of the sun per unit area, and that the effective temperature of the star is about 13800° ; by the independent photometric method he found 13300° as the temperature.

While the general failure to detect a secondary minimum in the light-curve of Algol suggests that the satellite only emits a negligible quantity of light, Dr. Nordmann's results indicate that the satellite is not the obscure, cool body it is generally supposed to be, but has an effective temperature and a surface brightness of the same order

as those of the sun, to which it is about equal in diameter. The temperature found is equal to, or less than, 5730° , and the magnitude is not greater than 5.5. For the sun he obtained a temperature of 5320° , and for γ Cygni, which Lockyer places in the Polarian class, a stage higher than the Arcturian class which includes the sun, he found 5670° by his photometer method, but he concludes that Algol's satellite has a temperature not very superior to that of γ Cygni. Finally, he shows that, alone, the radiation from Algol would probably suffice to maintain the surface of the satellite turned towards the primary in a state of incandescence.

HALLEY'S COMET.—In a letter to *The Observatory* (No. 434, April) Mr. Keeling directs attention to an apparent brightening of Halley's comet early in March. From November, 1910, to February 5, the comet was becoming fainter, from mag. $14\frac{1}{2}$ to mag. $15\frac{1}{2}$, but on March 4 both the visual and the photographic observations at the Helwan Observatory showed it to be much brighter, smaller, and more sharply defined than during the previous four months. Its magnitude, determined from two plates taken on that date, was $14-14\frac{1}{2}$, but it was half a magnitude fainter again on March 8. The Helwan observations show that throughout the long period it has now been observed during this apparition it has been about a magnitude brighter visually than photographically.

At the last meeting of the Royal Astronomical Society Mr. J. H. Reynolds directed attention to the distinct type of tail emanating from the comet on different dates. The Helwan photographs form a very long, connected series, and from them Mr. Reynolds suggests that the type of tail presented depends upon the distance from the sun rather than upon the size of the comet; when near the sun the tail appears as a prolongation of the envelopes around the nucleus, but when distant it takes the form of streamers radiating from a point directly behind the nucleus. Investigations by Mr. Knox Shaw indicate that at distances from 0.4 to 0.7 the tails are of the extended envelope type, from 0.7 to 0.8 they are of an intermediate type, and above 0.8 they are of the radiating type, such as seen in the case of Morehouse's comet.

A continued ephemeris for the comet is published by Dr. Ebell in No. 4492 of the *Astronomische Nachrichten*.

OBSERVATIONS OF JUPITER.—In the April number of *L'Astronomie* M. Antoniadi describes his observations of Jupiter made at the Barbier, the Meudon, and the Juvisy observatories during 1910. Numerous spots, clouds, and disturbances were seen and are described, and it is remarked that the suggestion, made in 1902, that the Red Spot is pushed forward by the great disturbance which overtakes it periodically, was confirmed by the observations made in July; on July 25 the longitude of the Red Spot was 356° instead of 358° . A splendid drawing in colours is reproduced on a plate accompanying the article.

GEOLOGICAL WORK IN BRITISH LANDS.¹

II.—IN AUSTRALASIA.

THE Geological Survey of Western Australia suffers, like that of India, from the pecuniary attractions offered by mining companies. It thus lost Mr. Brooking at the end of 1909, but hopes to retain other efficient officers. In the Annual Progress Report for that year (issued in 1910), Mr. H. P. Woodward describes an association of albite and tantalite in pegmatite dykes (p. 17) which recalls the famous dyke with rare black minerals at Ytterby. The albite has been removed in one reef and replaced by quartz, furnishing another point of similarity between the Australian example and those of Swedish isles. The Bulletins recently issued rightly devote much attention to mining interests. We are glad to note that Mr. J. Allan Thomson, lately one of the Rhodes scholars from New Zealand, contributes the petrographical matter to No. 33. He provides, among other points, an interesting discussion on uraltic hornblende (p. 132). The mining memoirs, such as this on the Gascoyne and Pilbara Gold-fields, and No. 38 (1910), on the Irwin River Coalfield,

¹ The first article appeared in NATURE of February '23, 1911 (vol. lxxxv., p. 553).